



MONTANA FISH, WILDLIFE & PARKS

12-YEAR SUMMARY OF WATERBIRD SURVEYS AT FREEZOUT LAKE WMA 2009 - 2020

BACKGROUND & NEED

In Montana, 11 colonial-nesting waterbirds are Species of Concern (SOC). Freezout Lake WMA (FLWMA) provides critical foraging habitat for all 11 species and breeding has been documented for seven species. Formal statewide waterbird surveys were conducted in 2009 – 2011 as part of the USFWS led Western Colonial Waterbird Monitoring and Inventory which identified all major nesting colonies in the state for most species. FWP's long-term strategy for monitoring colonial-nesting waterbird populations in Montana calls for annual surveys at just 15 breeding sites across the state. Freezout Lake WMA has been designated a key monitoring site because it supports both a diversity and relatively high numbers of nesting waterbird species. Freezout Lake supports >30% of Montana's known breeding pairs of Western Grebe, Clark's Grebe, Forster's Tern and Common Tern and approximately 15% of Black-crowned Night-Heron and Double-crested Cormorant colonies. Freezout Lake WMA is critical to maintaining stable waterbird populations in Montana.



OBJECTIVES

1. Conduct nest surveys for waterbirds at Freezout Lake WMA as part of Montana's strategy for monitoring colonial-nesting waterbird populations; 2020 marks the 12th year of formal surveys.
2. Document nest activity at known survey areas within the WMA to track productivity.
3. Survey new areas to locate additional breeding colonies within the WMA.
4. Better understand how annual conditions and management of the WMA may affect waterbird presence and nesting activity.



SURVEY METHODS

Surveys are conducted annually at Freezout Lake WMA for six colonially-nesting waterbirds and other species of interest as time permits (Table 1). Surveys take place in June, to target the window when most waterbirds have active nests. In 2020, surveys were conducted on June 11 and 12 by Kristina Smucker, Brent Lonner, Catherine Wightman and Allison Begley. Colony locations and nest structure vary by species. Cormorants and some gull and tern species nest on islands and nests are counted by walking through the colony. Grebes, Black-crowned Night-Herons, and

other tern and gull species build floating platform nests, within and along bulrushes, and nest counts are conducted from either airboat or kayak. We attempt to minimize disturbance by conducting counts quickly.

SURVEY AREA

There are four focal areas for surveys: the bulrush patch at the “thumb” of the Main Lake, Pond 5, Pond 3 and Pond 1 (Figure 1). Ponds 2, 4 and 6 are too shallow to support target waterbird nest colonies in most years but provide important foraging and nesting habitat for other waterbird, shorebird and waterfowl species.

RESULTS

Nesting activity varies from year to year and 2020 was a very good year for most waterbird species at the WMA (Table 1, Figure 2). Nest counts this year were above the 10-year average for all focal species except Common Tern. While we aren’t able to track all the environmental factors that contribute to a good nesting year, we tend to see higher numbers when ponds are full. Water levels at most ponds were at or near capacity in 2020, due to snowpack at 105% within the Sun/Teton/Marias River basins, combined with good spring and early summer irrigation flows into Freezout Lake.



Figure 1. Freezout Lake WMA and waterbird survey areas.

Table 1. Colonial-nesting waterbirds surveyed annually at Freezout Lake WMA, 10-year average number of nests (2009 – 2018), and 2020 nest counts and nest colony type. Focal species are in italics, those in bold are SOC. For species that nest inconsistently at the WMA a 10-year average is not meaningful; instead, the year(s) in which nesting was documented or strongly suspected is reported for these species.

Species	10-yr avg N nests	N nests in 2020	Floating nest	Nest on islands
<i>Double-crested Cormorant</i>	156	189		X
<i>Black-crowned Night-Heron</i>	13	15	X	
<i>Western Grebe</i>	34*	111	X	
<i>Clark's Grebe</i>	*	22	X	
Eared Grebe	6	13	X	
<i>Forster's Tern</i>	12	23	X	
<i>Common Tern</i>	28	0		X
Black Tern	Nested in 2013	0	X	
Caspian's Tern	Nested in 2012 & 2019	0		X
Franklin's Gull	0	30	X	

* the 10-year average reported for Western Grebe uses combined counts for Western and Clark's Grebes because nests cannot be differentiated.



2020 HIGHLIGHTS

1. 2020 was a very productive year – we recorded above average nest numbers for all focal species except Common Tern, which did not nest this year (Figure 2, Table 1).
2. Numbers were especially high for Western & Clark's Grebe – over 100 nests were recorded in traditional survey areas, whereas the 10-year average is 34 nests. In addition, a new colony was discovered on Pond 1, bringing the total to 133 nests. This area will be surveyed in future years.
3. Common Tern did not nest on islands in either Pond 1 or Pond 3. This is the third consecutive year that the traditional nest island in Pond 1 has supported gulls, but not terns.
4. Franklin's Gulls nested on the WMA for the first time in > 10 years. 30 nests were found among grebe, tern and night-heron nests in the bulrush patch at the "thumb" of the Main Lake. One Red-necked Grebe nest was found on Pond 1, also the first nest record in > 10 years.

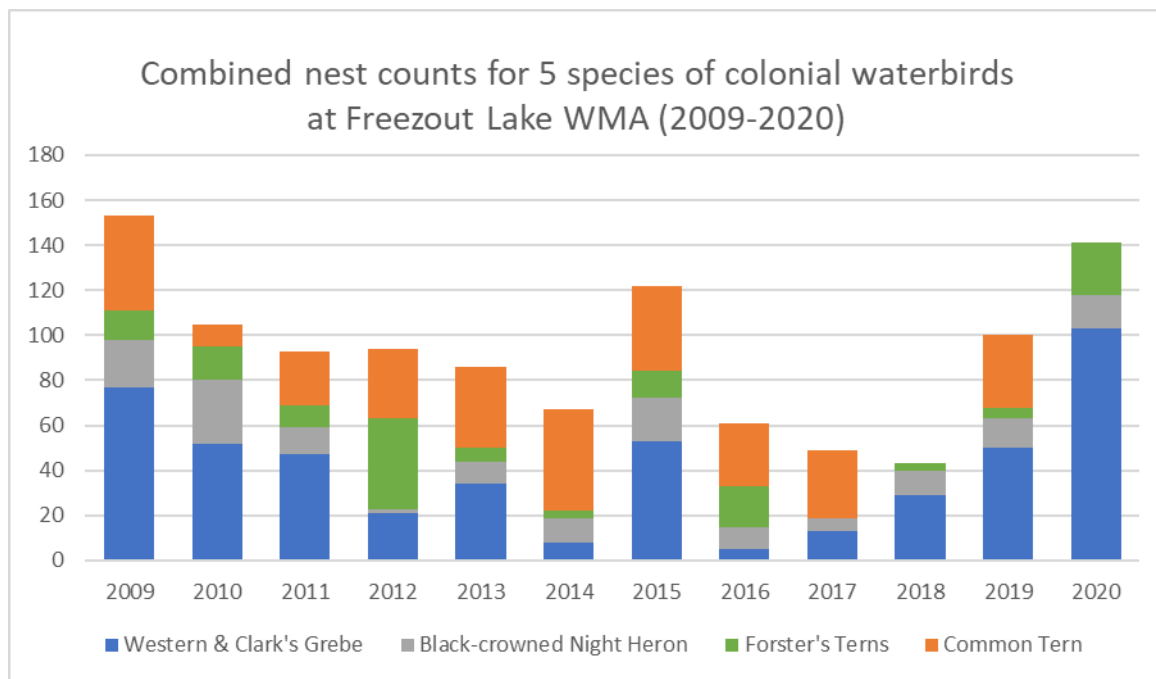


Figure 2. Four of five focal species nested in strong numbers in 2020, yielding a total of 141 nests in traditional survey areas. To aid in comparing numbers among years the Western Grebe nests from the new colony on Pond 1 are not included in this figure.

Many colonial-nesting waterbird species cope with annual variability in water levels by shifting the location of breeding colonies. At Freezout Lake it appears that species nesting in bulrush patches move nesting colonies among ponds, perhaps to find the right water level. This tends to maintain some consistency in the total number of nests at the WMA. For example, in 2012 waterbirds did not nest on Pond 5 (Figure 3 – red arrow), probably because the pond was drained in 2011 for management purposes and water levels were too low for nesting when birds returned in May 2012. Western Grebe and Black-crowned Night-Heron instead nested on the Main Lake (Figure 4) and Forster’s Tern nested on Pond 2 (Figure 8).

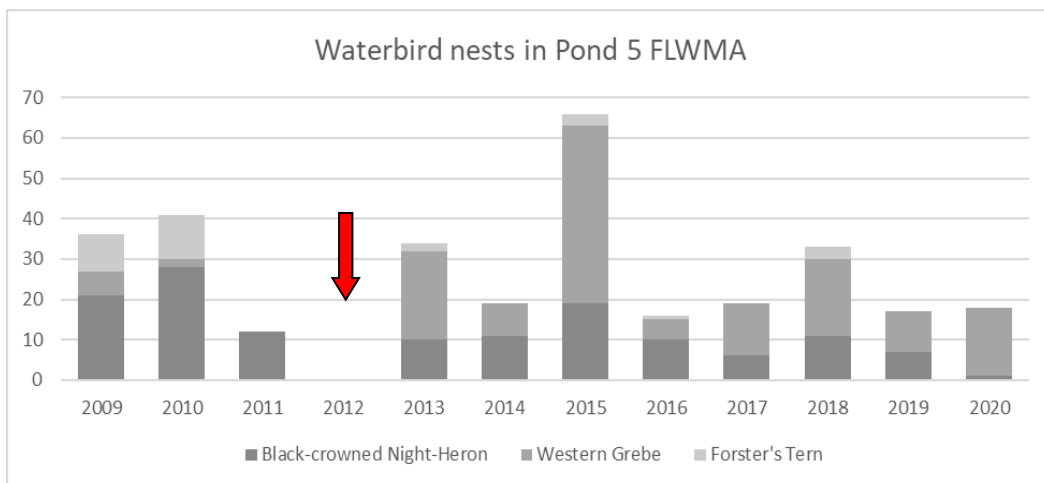


Figure 3. Number of Western Grebe, Black-crowned Night-Heron and Forster’s Tern nests on Pond 5. Nest numbers tend to be lower but more consistent at Pond 5. This pond receives some of the most consistent inflows, making water levels more stable than at other ponds in most years. The red arrow indicates the low water conditions in 2012.

On the Main Lake, 2016 and 2017 were low water years; waterbirds did not nest at the thumb in either year (Figure 4 – red arrows). However, the relationship between water level and nest activity is not always consistent. We noted normal water levels in 2014, 2015 and 2018 and waterbirds either did not nest, or nested in very low numbers, on the Main Lake but nested in typical numbers on Pond 5.

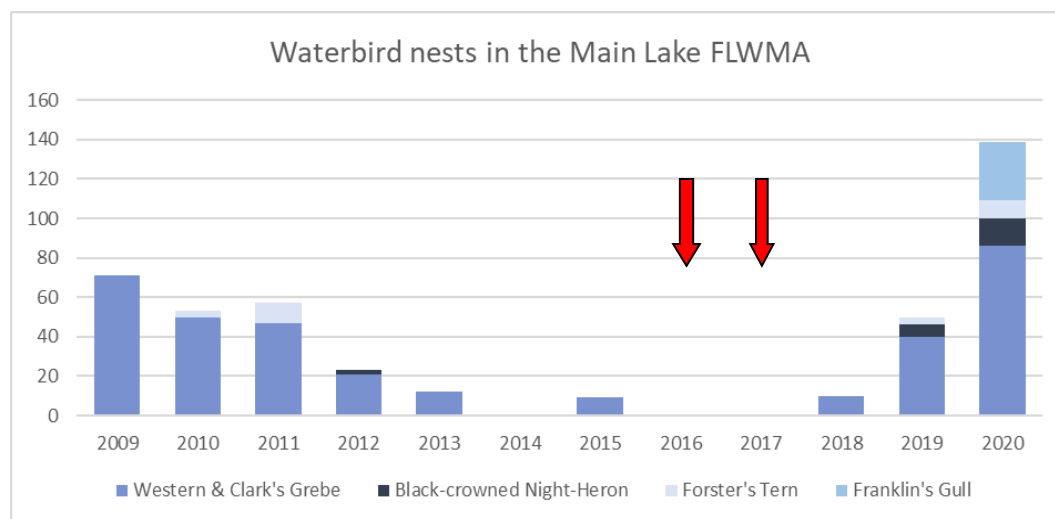


Figure 4. Number of Western Grebe, Clark’s Grebe, Black-crowned Night-Heron, Forster’s Tern and Franklin’s Gull nests. Low water years, indicated by red arrows, may explain the lack of nest attempts in some years (e.g. 2016 & 2017), but not others (e.g. 2014). It’s also unclear what drives very high productivity, as observed in 2020.

SPECIES ACCOUNTS

Black-crowned Night-Heron

This is one of the few herons distributed worldwide; while commonly found in wetlands throughout the midwest, in Montana they are restricted to just a handful of breeding sites. As their name suggests, Black-crowned Night-Heron are most active at dusk and night. They are opportunistic feeders with a diet that includes fish, aquatic invertebrates, amphibians and even small mammals. At Freezout, they build floating platform nests within bulrush patches among grebe and Forster's Tern colonies. In most years, Pond 5 supports a majority of the nests but in 2020 we found 14 of the 15 nests in the colony on



the Main Lake (Figure 5). While the species does not breed in high numbers on the WMA, Freezout is one of just eight sites in Montana that supports breeding colonies. This year's count was slightly above the 10-year average of 13 nests, and colony size ranges from 2 – 28 nests.

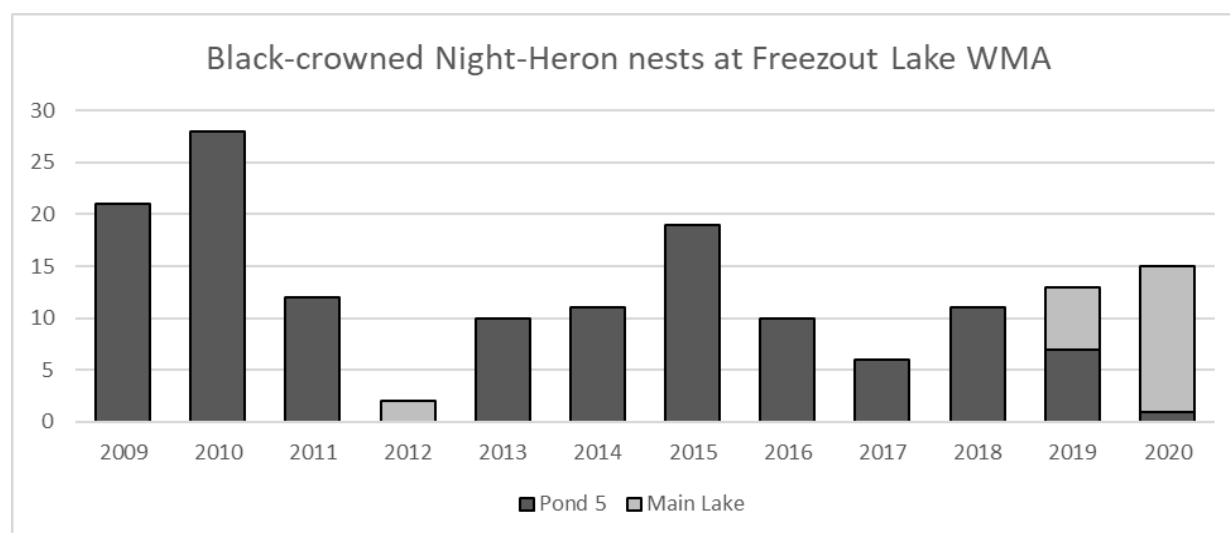


Figure 5. Annual nest counts at Black-crowned Night-Heron colonies on Pond 5 and the Main Lake.

Double-crested Cormorant

This species is widely distributed across North America and occurs on both coasts and the interior of the US. They feed primarily on fish and in some parts of their range may consume fish of recreational or commercial interest. This is not likely an issue in Montana – a study at Canyon Ferry revealed that the dominant species were stonecat, dace and suckers, while trout made up just 13% of the diet. At Freezout, carp mostly likely make up a majority of their diet, given their availability in the system. From a management perspective this is ideal because carp are not native to the system.



Brent Lonner



Kristina Smucker

Cormorants nest on two islands each in Ponds 1 and 5. Nesting begins in mid-April, earlier than other waterbird species. At Freezout, 30 – 60 nests are packed together on each tiny island, with an average of 3-4 chicks per nest begging for food. An island used by cormorants for nesting is a noisy, crowded place.

Statewide waterbird surveys from 2009 – 2011 found cormorant colonies at 11 – 14 sites per year with the largest colonies at Canyon Ferry WMA (340 – 371 nests/year) and Bowdoin NWR (254 nests in 2010). Nonetheless, Freezout is an important breeding site with stable to increasing counts between 87 and 221 nests/year (Figure 6). The 2020 nest count was 189, slightly above the long-term average of 156 nests/year.

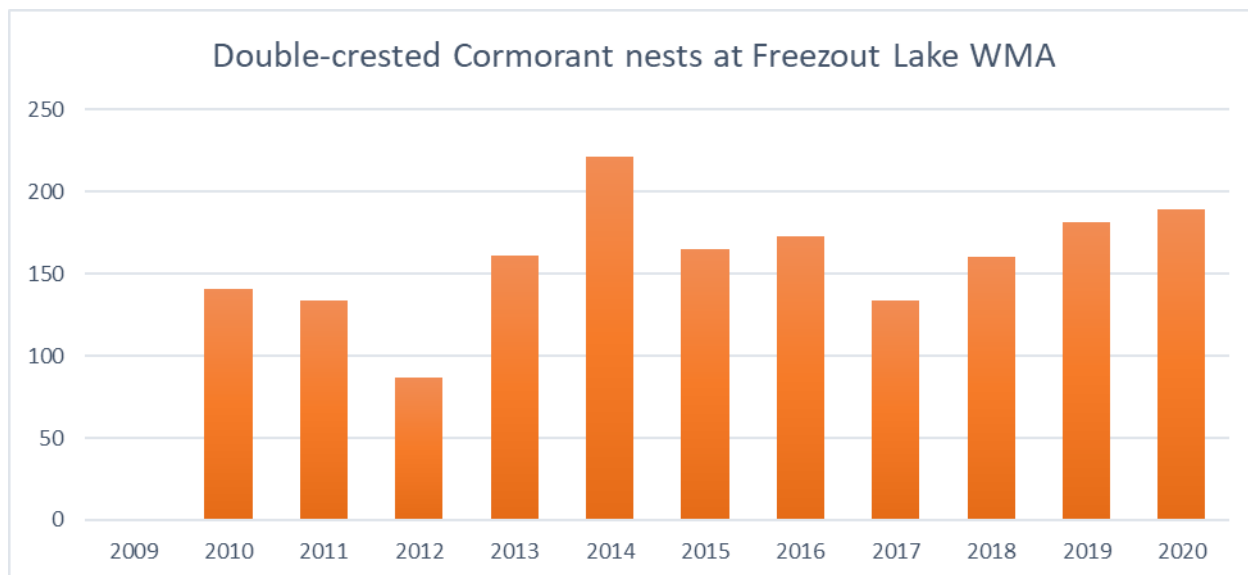


Figure 6. Combined annual nest counts at Double-crested Cormorant colonies on 4 islands in Pond 1 and Pond 5.

Western and Clark's Grebe

These grebes are similar in appearance and best distinguished by looking at the eye – if it is surrounded by black feathers, it is a Western; if surrounded by white, it is a Clark's. Both species eat primarily fish, stabbing prey with their sharp bills. Clark's Grebe is an SOC and evidence of breeding has been found at just four sites in Montana with colonies documented only at Freezout Lake WMA and Ninepipes NWR. In 2020, photo documentation of a Clark's Grebe at its nest at Freezout was significant.



Clark's Grebe guarding its floating platform nest

Western Grebe are more common, with evidence of breeding at 19 locations in Montana, though statewide surveys from 2009 – 2016 found colonies at only five sites. While not an SOC, we have made Western Grebe a focal species for long-term monitoring at Freezout. Nest counts for the two species are lumped, and we estimate the number of Clark's vs. Western Grebe nests using the ratio of adults on the water because their nests cannot be differentiated. Both build floating platform nests along and within bulrush patches at the "thumb" of the Main Lake and on Pond 5. In 2020 we counted 103 nests at these two locations, more than in any previous year (Figure 7). In addition, we surveyed a cattail patch that rings a large island in the center of Pond 1 and found a new colony with 30 nests, bringing the total to 133 Western/Clark's Grebe nests. It is possible, even likely, that grebes have nested at the Pond 1 location in previous years; we will continue to monitor this site to determine if it is used annually.

For these grebes, we see a lot of annual variation in colony size, with nest counts that range from 5 – 77 nests (average: 34). Our surveys are not designed to explain this variability, but it seems possible that these grebes are sensitive to water level, given low counts in 2016 and 2017, which were both low water years.

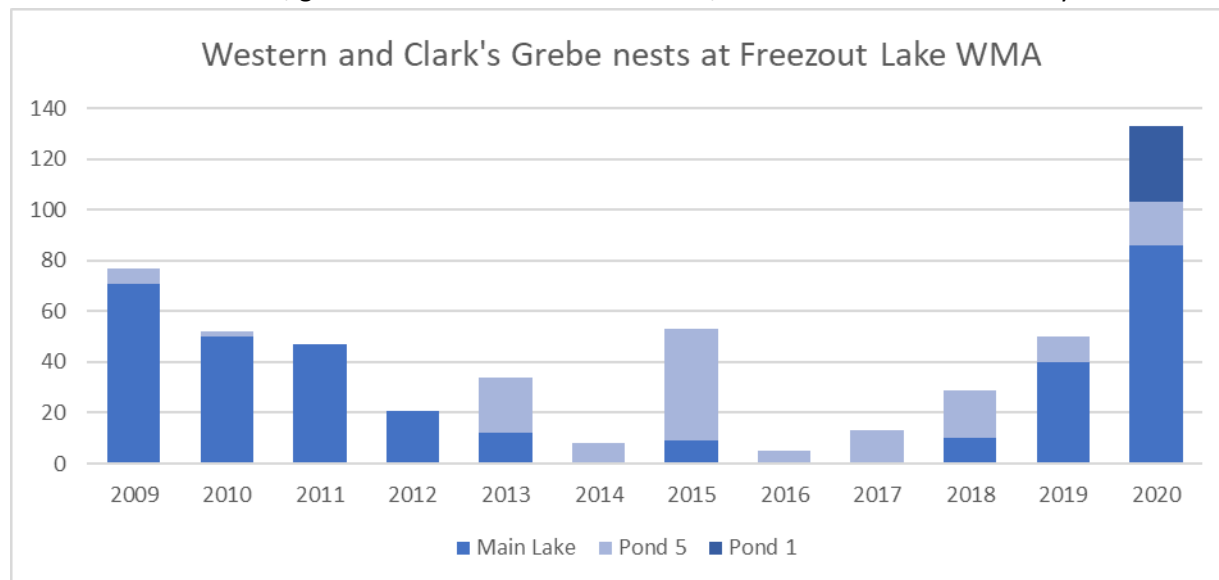


Figure 7. Annual nest counts at Western and Clark's Grebe colonies on all ponds within the Freezout Lake WMA. Note the new nest colony discovered on Pond 1 in 2020.

Red-necked Grebe

This grebe's breeding range is mainly north of Montana and it is an uncommon breeder on lakes and ponds west of the divide. Red-necked grebe typically nest solitarily or in loose colonies, so they are not well surveyed in colonial waterbird surveys. The only large colony documented in Montana is at Georgetown Lake (~ 70 nests). Their diet is primarily fish but also includes aquatic invertebrates.

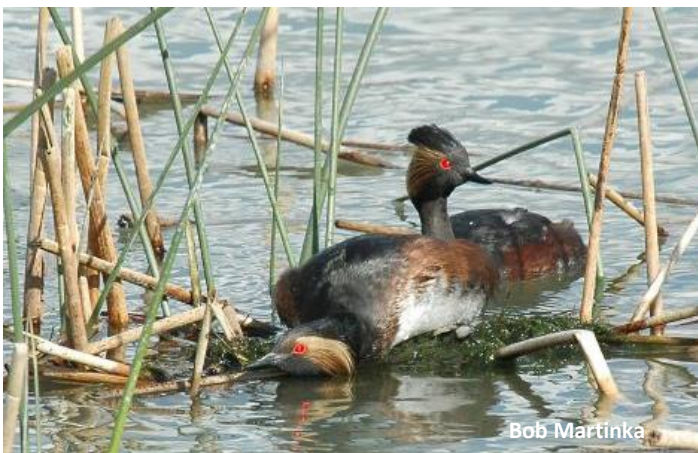
In 2020 we found one Red-necked Grebe nest within the colony of Western Grebes on Pond 1. This grebe is not a focal species in our surveys at Freezout, so they may nest in small numbers on the WMA in most years.

Regardless, there are fewer than 20 breeding records east of the divide and this is the first nest record from Freezout in many years. Mike Schwitters recorded nests at the WMA in 1993 and 1995. Incidental nest records are useful for documenting the distribution and persistence of this species at known breeding sites.



Eared Grebe

A common breeder across Montana, this grebe typically nests in large colonies and its diet is primarily invertebrates, rather than fish. The largest colonies in the state are at Manning Lake, Homestead Lake and Lake Bowdoin where nest numbers range from 550 to 1000 pairs. Eared grebes favor alkaline lakes and often breed on ephemeral wetlands; for this reason, the number and distribution of nests may vary widely from year to year. After breeding, most of the population migrates to Mono Lake, CA or the Great Salt Lake, UT to gorge on brine shrimp and alkali flies. Eared grebe may gain up to 25% of their body weight at these staging areas, before migrating further south to wintering grounds.



In many years, we find small numbers of Eared Grebe nests within the Western Grebe colony on Pond 5. In 2020, we found 13 nests, which is above the 10-year average of 6 nests. Eared grebe has not been a focal species, and as such our annual count data is not precise enough to look at patterns in nest activity but is useful for documenting distribution and persistence.

Caspian Tern

Caspian Tern are the world's largest tern and can be differentiated from Forster's and Common Tern by their black legs and larger size. All terns forage on the wing and can be easily distinguished from gulls even at a distance because of their feeding behavior in which they hover before diving for fish.

Caspian Tern appear to be rare breeders at Freezout, are uncommon breeders throughout Montana and are an SOC due to lack of information on population size and trend. We documented two nests in 2019 – one on an island in Pond 3 and one on a platform nest in Pond 2, which is atypical since these terns usually nest on islands. In 2012 we observed a pair strongly defending an island in Pond 1, but no nest was found. The only other record of a nest at FLWMA was in 1992. The Montana Natural Heritage Program database contains nest records for Caspian Tern at just 5 other locations in the state: Ninepipes NWR, Canyon Ferry WMA, Bowdoin NWR, Medicine Lake NWR, and at several sites on Fort Peck Lake. Because this tern breeds infrequently on the WMA, it is not a focal species, but we look for foraging adults while trying to differentiate between Forster's and Common Terns, which look very similar.



Black Tern

This tern nests in loose colonies, building floating platform nests in small prairie marsh complexes. They forage by picking up insects and small fish on or just below the water surface. They are an SOC because of continent-wide declines concurrent with the extensive loss of wetlands. Black Tern nested at Freezout in the 1990s – records in the MNHP database from 1991, 1995 and 1996 document colonies with as many as 8 nests or 50



adults. However, no nests have been confirmed in the past 12 years of formal surveys, though nesting was strongly suspected in 2013 on Pond 3, in the bulrush patch alongside Forster's Terns. Black Tern nests are notoriously difficult to find and if they are nesting in Pond 2, we may be missing nests because this pond is too shallow to survey effectively in most years. However, the terns are definitely not nesting in the areas they used in the 1990s and have only been observed foraging in small numbers in five of the past 12 survey years. It seems this species has become a less common breeder at Freezout Lake in the past 20 years.

Though not a focal species, we search for foraging adults and/or nests during our annual surveys

because Freezout was once an important breeding site. In statewide waterbird monitoring surveys between 2009 – 2016, Black Tern colonies were found at only 18 sites, primarily at smaller wetland complexes than those that support the large numbers of other colonial-nesting waterbird species.

Forster's Tern

This tern builds floating platform nests and at Freezout we often find them within Western/Clark's Grebe and Black-crowned Night-Heron colonies on Pond 5 and at the thumb of the Main Lake, or as single species colonies on Ponds 2 and 3. Forster's Tern breeding colonies appear to have the widest distribution on the WMA, compared with other waterbird species, and the pond(s) selected for breeding in any given year are highly variable (Figure 8). In 2020 we counted 23 nests, well above the 10-year average of 12 nests.



As with the grebes and night-herons, Forster's Terns appear to be searching for the right water level. Pond 3 was low or dry in 2012, 2016, 2017 and 2018 and the terns nested at this pond only in 2016. In 2012, when we documented a very large nest colony at Pond 2, both Ponds 3 and 5 were low and conditions seemed less than ideal on the Main Lake, as grebes and night-herons nested in very low numbers there. But as with other waterbird species, water levels do not explain all the variation in nest productivity; while low water levels across the WMA in 2017 coincide with the only year Forster's Terns did not nest at Freezout, 2016 was also a low water year but the number of nests was above the 10-year average.

Forster's Tern is an SOC due to lack of information on population trends and the small number of nesting colonies – statewide waterbird surveys from 2009 - 2016 documented colonies at just 8 sites.

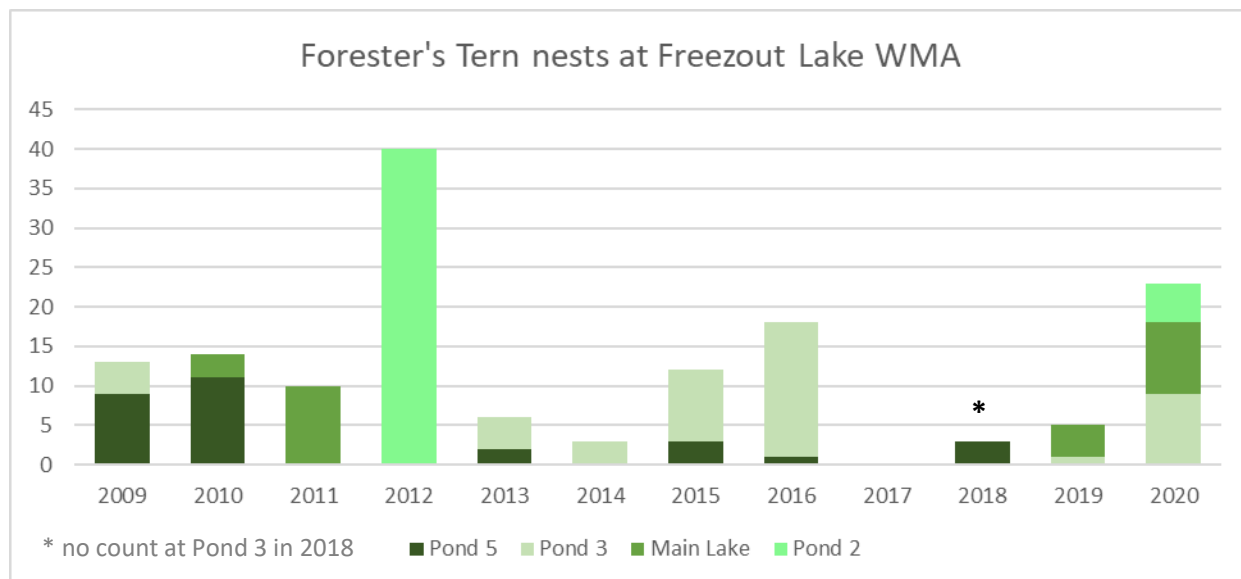


Figure 8. Annual nest counts at Forster's Tern colonies on all ponds within Freezout Lake WMA.

Common Tern

Common Tern colonies at Freezout are found only on islands in Pond 1 and Pond 3 but did not nest in 2020 (Figure 9). This tern has nested on a single island in Pond 1 every year through 2017, which was also the first year we documented five gull nests on the island. 2020 marks the third consecutive year that Common Tern have not nested on the island in Pond 1 and gull nests have increased each year. Because we have not consistently recorded the number of gull nests in annual surveys it is difficult to know whether their presence is influencing tern nesting behavior on the island. Common Tern can certainly tolerate other species nesting within the colony and we have recorded American Avocet and gull nests within the tern colonies at both ponds. At Pond 3, Common Tern nest on one or more of the 4 islands, alternating across years; they seem to prefer the island with the least vegetation.



Like all terns in Montana, this species is an SOC due to lack of information on population trends and the small number of nesting colonies in Montana – statewide waterbird surveys from 2009 - 2011 documented just 5 colonies. At Freezout, the 10-year average number of nests is 28, so it is a key breeding site for the species.

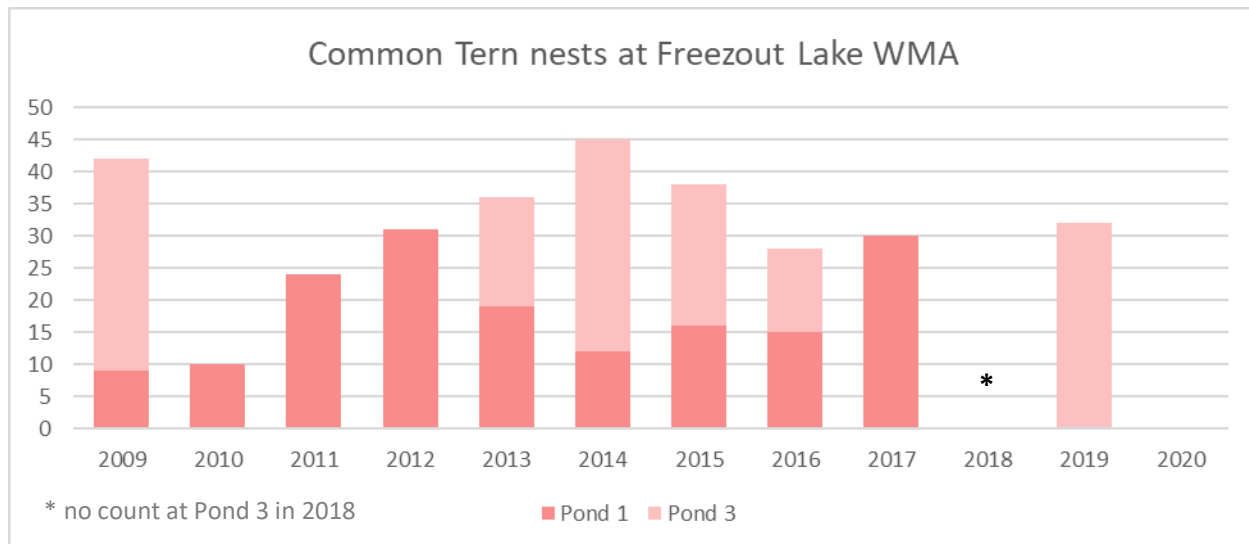


Figure 9. Annual nest counts at Common Tern colonies on four islands in Pond 1 and Pond 3.

California and Ring-billed Gulls

While many people think of gulls as “seagulls” that occur on the coast, there are several inland nesting gulls in North America, including all three species found at Freezout. California and Ring-billed Gulls are widespread and abundant in Montana and colonial waterbird surveys in 2009 – 2011 documented large colonies at ten to eight sites each year. Colonies can be very large – 3,366 California Gull nests at Canyon Ferry WMA in 2010 and 3,520 Ring-billed Gull nests at Bowdoin NWR in 2009. Both species build minimalist nests on the ground, usually on islands or peninsulas with sparse vegetation.



Nest colonies at Freezout are small compared with other sites around the state and we have not counted nests systematically. In 2017 we observed the first gull nests on the island in Pond 1 that supports the Common Tern nest colony. In 2018, when no terns nested on the island, we began counting or estimating the number of nests on the islands in Pond 1. The highest nest counts to date are 55 California Gull and 8 Ring-billed Gull nests in 2019. We will continue to monitor numbers on the islands in Pond 1 and Pond 3 and try to determine whether they are influencing the distribution and number of Common Tern nests.



Franklin's Gull

Franklin's Gulls nested on the WMA in 2020 for the first time since systematic surveys began 12 years ago. 30 nests were found within the grebe, tern and night-heron colonies on the Main Lake. However, they were abundant breeders at the WMA in the 90s through the early 2000s; in 1995 Mike Schwitters noted hundreds of nests in the bulrushes at the north end of the Main Lake. There are just four other breeding colonies in the state, the closest and largest colony in the state is at Benton Lake NWR with an estimate of 4833 nests in 2010.

